CLAIMS

What is claimed is:

1. A capillary stream droplet generator comprising

a reservoir,

an orifice plate coupled to the reservoir,

an orifice coupled to the orifice plate and in fluid communication with the reservoir, and

a transverse disturbance generating member coupled to the orifice plate.

2. The droplet generator of claim 1 wherein the disturbance generating member includes a piezoelectric crystal.

3. The droplet generator of claim 2 wherein the disturbance generating member further comprises a piezoelectric crystal restraining mass coupled to the piezoelectric crystal.

4. The droplet generator of claim 1 further comprising a shock absorbing gasket interposing the orifice plate and reservoir.

5. The droplet generator of claim 1 further comprising a ball interposing the orifice plate and the disturbance generating member.

6. The droplet generator of claim 1 wherein the orifice plate has a rectangular cross section.

7. A method of generating droplets from capillary stream breakup comprising the steps of

generating a capillary stream of material,

applying a transverse disturbance to the stream, and

forming droplets from the stream.

8. The method of claim 7 wherein the applying a disturbance step comprising exciting a piezoelectric crystal.

9. The method of claim 8 wherein the exciting step comprising applying a sine wave excitation to the piezoelectric crystal.

10. The method of claim 8 wherein the exciting step comprising applying a square wave excitation to the piezoelectric crystal.

11. The method of claim 7 wherein the generating a capillary stream comprising ejecting the material from an orifice.

12. The method of claim 11 wherein the applying a disturbance step comprising vibrating the orifice in a direction orthogonal to an axis of the stream.

13. The method of claim 12 wherein the applying a disturbance step comprising exciting a piezoelectric crystal coupled to the orifice.

14. The method of claim 7 wherein the applying a disturbance step comprising applying a traverse acoustic wave to the capillary stream.

15. A capillary stream droplet generator comprising

a reservoir adapted to hold motel metal,

an orifice in fluid communication with the reservoir, wherein the molten metal is ejected from the orifice to form a capillary stream, and

an acoustic wave generator adapted to direct a transverse acoustic wave to the capillary stream.

16. The droplet generator of claim 15, wherein a wavenumber, k_0*, is between zero and one, where the wavenumber, k_0*, is the ratio of an initial circumference of the capillary stream to a wavelength of the transverse acoustic wave.

17. The droplet generator of claim 15, wherein the acoustic generator directs the transverse acoustic wave above a break-up point of the capillary stream.

18. The droplet generator of claim 15, wherein the orifice is formed in the bottom of the reservoir.